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are established when the egg has only forty-eight cells. The rosette cells are very large; and the ciliated prototroch, which consists of sixteen cells, derived from the first set of 'micromeres,' forms a complete girdle around the egg.

A typical trochophore is formed, of which the plane of bilateral symmetry corresponds to a vertical plane bisecting *B* and *D* of the four-celled stage. A postoral circlet of strong cilia appear at a short interval behind the prototroch, and a long tuft of flagella is still earlier developed upon the apical plate. There is no true paratroch. Eye spots are present, and trochophores and larvæ are positively phototactic.

No traces of metameric segmentation manifest themselves throughout the course of development, which was observed continuously until the young worms had reached the age of seven weeks. This and certain other embryological facts seem to indicate that the *Gephyrea* are somewhat more closely related to the *Platyhelminthes* than to the *Annelida*.

Notes on the structure of Alma nilotica, a gilled earthworm from Egypt: P. M. REA.

Alma nilotica Grube, has been known since 1855, but has never been thoroughly investigated. Its systematic position is uncertain, but the present research shows conclusively that it is an Oligochaete having many of the characteristics of the Geoscolicidae. The possibility of the identity of this form with the genus *Siphonogaster* of Levinsen increases the interest of this remarkable worm. The material available at present is sexually immature, but it is hoped that specimens collected in the spring will determine this point. A pair of ovaries has been demonstrated in segment 13 and testes in 10 and 11, but no evidence of the enormous penial processes of *Siphonogaster*.

The gills, which are the most characteristic feature of the worm, are out-pocketings

of the body wall, taking with them the layer of circular muscles but leaving the longitudinal muscles behind. They are provided with afferent and efferent blood vessels. The epithelium of the gills and whole body surface is highly vascular. The dorsal blood vessel extends no farther forward than the seventh segment, where it ends abruptly in the most anterior pair of hearts. There is a supra-oesophageal vessel and two remarkable lateral vessels which will be more fully discussed in a later paper. Connected with the lateral vessels are numerous spherical acini, closely approximated to the inner surface of the body-wall, which appear to be identical with the structures figured by Perrier as occurring on the walls of the oesophagus in Perichaeta.

On the life history of Autolytus cornutus and alternate generation in annelids: P. C. MENSCH.

The claim for alternate generation in annelids arises from investigation on the Syllidians, chiefly *Autolytus*. It was first suggested by Quatrefages and Krohn, but for the first time fully described by A. Agassiz for *Autolytus cornutus*. Agassiz regarded the parent stock as distinctly asexual and in this manner described a true alternate generation—the asexual parent stock alternating with sexual stolons.

The asexual condition of the parent stock is, however, not constant and the percentage of parent stocks with sexual products is sufficiently great to strongly indicate that the presence of reproductive products toward the close of the phenomenon of budding is a constant stage in the life-history of this Syllid. This being the case there would be, not an alternation of generation but at most only a sexual dimorphism.

Another aspect of this question is presented by the morphological characters of the stolon itself, in that the stolon does not